

Virtual Reality data exploration and mine planning with the Real-Time Mining Control Cockpit

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ABSTRACT

In April 2015 the multi-partner and multi-national European Commission funded R&D project Real-Time Mining was launched. The main objective was the development of an innovative technical solution for resource-efficient and optimal high precision/selective mining in geologically complex settings. Different components of autonomous positioning of mining equipment, spatially-referenced real-time sensor-based monitoring, extraction planning model updating together with decision and machine control optimization have been developed.

A central development was the integration, management and visualization of the heterogeneous data sets from the different partners and work packages. The Real-Time Mining Control Cockpit is an interactive 3D application with different screens for the clear presentation of the data resulting from the sensor-based monitoring processes as well as the calculated potentials for process optimization based on the 3D mine geometry. The modules include the visualization of the deposit-model, 3D extraction planning, integrated data of the positioning-system as well as the visualization of sensor and machine performance data. Different tools have been developed for supporting operation control and optimized decision making based on real-time data from the centralized database. The visualization cockpit is divided into two levels: The planning views offers various screens in which the information relevant for short-term planning and process optimization is displayed. In the operation views, current positions of mobile units and various sensor data are displayed georeferenced on the 3D model.

As part of the work, modern Virtual Reality hardware was integrated into the Control Cockpit. The use of head mounted displays enables an immersive exploration of the 3D data. This is even more intuitive and convenient than a classic 3D visualization and offers great opportunities to support optimized decision making.